RELION® PROTECTION AND CONTROL

GRID AUTOMATION REC615

Modification Sales Guideline

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Trademarks

Open Source Software

This product contains open source software. For license information refer to product documentation at *www.abb.com*.

Warranty

Please inquire about the terms of warranty from your nearest ABB representative.

www.abb.com/mediumvoltage

Disclaimer

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guaranteed properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This product has been designed to be connected and communicate data and information via a network interface which should be connected to a secure network. It is the sole responsibility of the person or entity responsible for network administration to ensure a secure connection to the network and to take the necessary measures (such as, but not limited to, installation of firewalls, application of authentication measures, encryption of data, installation of antivirus programs, etc.) to protect the product and the network, its system and interface included, against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB is not liable for any such damages and/or losses.

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In case of discrepancies between the English and any other language version, the wording of the English version shall prevail.

Conformity

This product complies with following directive and regulations.

Directives of the European parliament and of the council:

- Electromagnetic compatibility (EMC) Directive 2014/30/EU
- Low-voltage Directive 2014/35/EU
- RoHS Directive 2011/65/EU
- RoHS Directive (EU) 2015/863 amending Annex II

UK legislations:

- Electromagnetic Compatibility Regulations 2016
- Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

These conformities are the result of tests conducted by the third-party testing in accordance with the product standard EN / BS EN 60255-26 for the EMC directive / regulation, and with the product standards EN / BS EN 60255-1 and EN / BS EN 60255-27 for the low voltage directive / safety regulation.

The product is designed in accordance with the international standards of the IEC 60255 series.

Contents

1 Introduction

1.1 This manual

The modification sales guideline contains instructions on how to handle the Modification Sales process. The manual provides procedures for ordering, installation and verification of the Modification Sales delivery. The chapters are organized in the chronological order in which the Modification Sales process should be carried out.

1.2 Intended audience

This manual addresses the personnel responsible for ordering or installing the Modification Sales delivery.

The installation personnel must have the necessary skills to carry out the modification. They must be familiar with the REC615 relay configuration, parameter setting and testing using the Protection and Control IED Manager PCM600.

1.3 Product documentation

1.3.1 Product documentation set

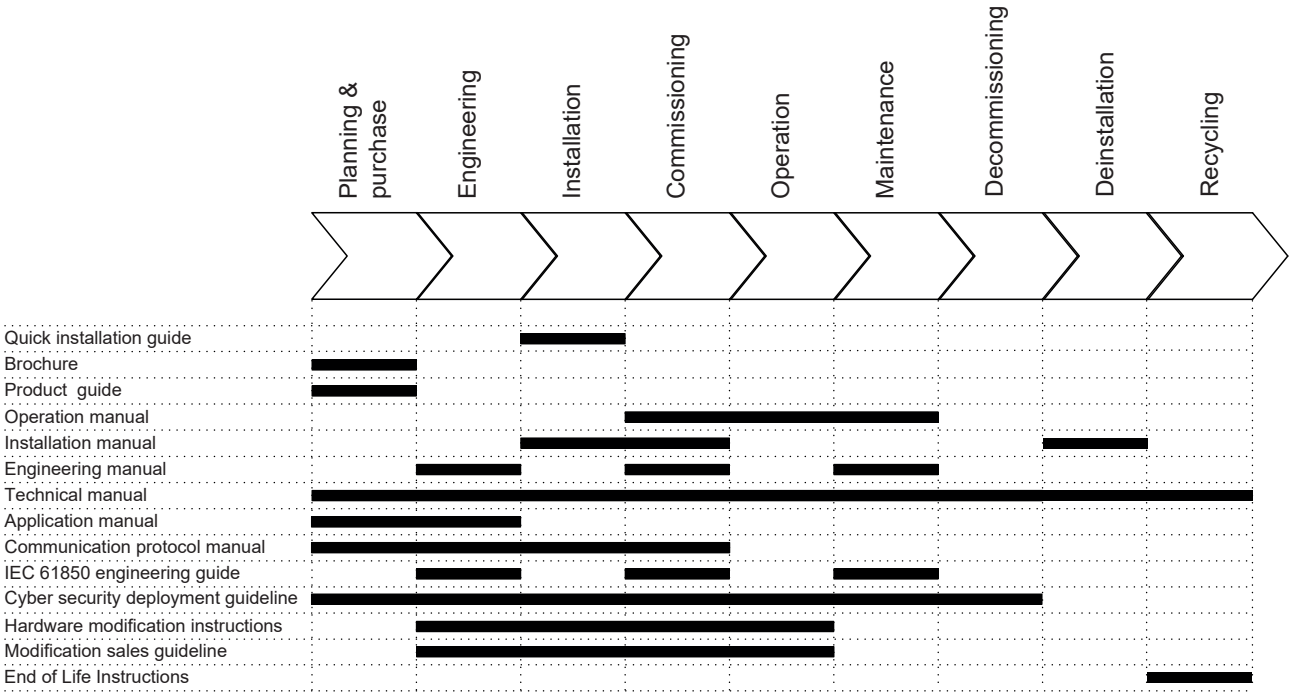

Figure 1: The intended use of documents during the product life cycle

1.3.2 Document revision history

Document revision/date	Product connectivity level	History
A/2025-03-12	PCL1	First release

1.3.3 Related documentation

Name of the document	Document ID
REC615 Hardware modification instructions	2NGA002474
REC615 Engineering Manual	2NGA002472

Download the latest documents from the *ABB Technical documentation portal*.

1.4 Symbols and conventions

1.4.1 Symbols

The electrical warning icon indicates the presence of a hazard which could result in electrical shock.

The warning icon indicates the presence of a hazard which could result in personal injury.

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader of important facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Menu paths are presented in bold.

  Select **Main menu** > **Settings**.
- Parameter names are shown in italics.

  The function can be enabled and disabled with the *Operation* setting.
- Parameter values are indicated with quotation marks.

  The corresponding parameter values are "On" and "Off".
- Input/output messages and monitored data names are shown in Courier font.

  When the function starts, the `START` output is set to TRUE.
- This document assumes that the parameter setting visibility is "Advanced".

2 Overview

Modification Sales is a process that supports change of functionality of a REC615 relay that has been already delivered from the factory. The Modification Sales order offers the same flexibility as the original relay order.

The Modification Sales process is based on the relay serial number. Each relay to be modified is handled individually. This applies to quoting, ordering, delivery and installation of the modification. One relay can be modified several times but the precondition for an additional modification is that the previous modification has been installed to the relay.

Modification Sales is available from relay factory for the asset owners and their delegated service providers. ABB Service can also perform the necessary modifications even for turnkey deliveries.

2.1 Relay hardware

It is possible to add new hardware modules into empty module slots in the relay. It is also possible to change an existing hardware module type to a different one. The rules for module slot allocation are the same as when configuring a new relay. Relays-Online can be used to determine the feasibility of the planned change. Changed/replaced hardware modules aren't refunded.

A spare hardware module alone cannot be used to modify a relay. The relay always requires a new license when its hardware or software is modified. The new license is a part of the Modification Sales delivery. Inserting an additional module into a relay or replacing a module type with another one without a proper license causes an internal fault in the relay.

2.2 Relay software

It is possible to add new application packages. Existing application packages can be removed but they are not refunded.

It is possible to add or remove communication protocols. In REC615 the customer can freely choose the communication protocols to be included in the product in addition to IEC 61850 which is always included. Removed protocols are not refunded.

3 Quotation and ordering

A quotation for the planned modification can be requested from Relays-Online or requested via the local ABB channel or directly from the factory sales representative. The following information must be included in the request:

- Relay serial numbers
- Detailed description of the planned modification for each serial number separately

https://relays.protection-control.abb/

Based on the received information, ABB verifies the feasibility of the requested modification and prepares a quotation.

If installation and verification of the modification is also needed, contact the nearest ABB representative for a turnkey delivery of modification.

4 Delivery

The modification package can contain hardware and software, or software depending on the required modification for one or several relays. When ordering hardware modifications for several relays within a single request they are delivered as a single package containing the required licenses, software, and related hardware. If the delivery should be split into several packages, customer needs to split the packages in the Relays-Online.

When the modification involves ordering software only or licenses for existing hardware then the preferred delivery is via download from Relays-Online. Download is available for the user who has signed up in *myportal.abb.com/welcome* portal and has logged in with email address provided in software user email. If download is not visible, please sign up. It is recommended to download the latest software from Relays-Online.

Modification sales do not change the relay warranty period. The guarantee period for the delivered hardware is the same as originally given for the relay for which the modification sales modules are installed or two years, whichever is longer. The guarantee period for the Modification Sales delivery starts on the date it is dispatched from the factory.

Example cases of modification:

- The modification includes only software, then the preferred way of delivery is via download from Relays-Online.
- The modification includes both software and hardware, but customer already has the needed hardware. Then the preferred way of delivery is by downloading the license for software and hardware from Relays-Online.
- The modification includes both software and hardware, then the software, licenses and hardware modules are delivered in a box. The software is delivered on a USB stick within the box. The software is available in Relays-Online after the order is ready from production.

5 Installation

5.1 Prerequisites

- Computer with latest released PCM600 and REC615 connectivity package versions. It is recommended to use the latest REC615 connectivity package available in the Update Manager.
- Up-to-date projects in PCM600 containing all the relays under modification
- Modification Sales package delivered as a .zip file
- Ethernet cable
- Replace the existing product labels with the new ones (two copies) included in the delivery.

  If the delivery contains material for the modification of several relays, check the correct label based on the serial number of each relay under modification.
- The delivery includes two modification files, package with latest firmware and license and package with only license. If the customer chooses the package that includes only license, then customer needs to check that the firmware has the correct connectivity level. It is must to keep the relay firmware up to date.

  Check the latest relay firmware from ABB Data Care.
- Adequate access rights to perform software update for the relay

As the relay is in the factory default configuration state after the license update process, ensure that the current configuration of the relay under modification is available in the PCM600 project. If needed, select **Read from IED** before starting the update process.

ENGINEER access rights are needed to update configuration.

ADMINISTRATOR access rights are needed to manage user access rights.

System update rights are needed to update the relay firmware. (Refer to table Default roles-to-rights in REC615 Cyber Security Deployment Guideline)

5.2 Adding or changing hardware modules

See REC615 Hardware modification instructions (2NGAxxxxxx) for the required tools and other information related to the modification. The document is included in the delivery.

Disconnect the relay's auxiliary voltage and carry out modifications on a de-energized feeder.

Check the printed documentation included in the modification package delivery. Follow in detail the Relay module modification table in the Modified Product document or *Table 1*.

5.3 Updating REC615 license

1. Connect the relay to a computer with PCM600 using an Ethernet cable. It is recommended to disconnect/disable all the other wired and wireless network connections of the computer except the one used in connecting to the relay.
   - Front port has DHCP service and IP address is obtained automatically. If static IP address is used, then computer network adapter address shall be in the same subnetwork as front port. Default address for front port is 192.168.0.254.

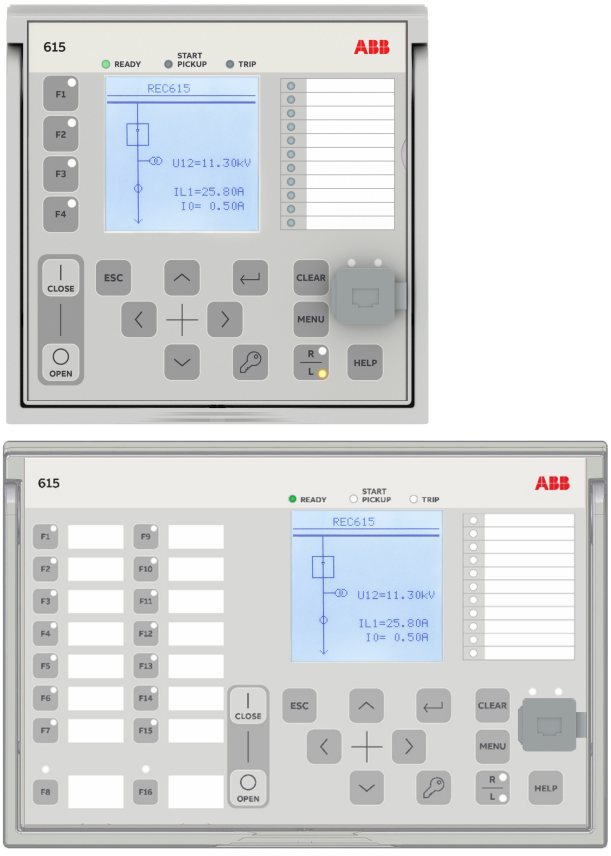

Figure 2: Front port on the communication module (standard and wide)

Disconnect all Ethernet station communication interfaces (LAN) of the relay.

2. Connect the relay's auxiliary voltage and wait for the relay to fully start up.

   In case a hardware module has been changed or added, the hardware composition is no longer valid for the current license and the relay is in Internal Relay Fault (IRF) state. This is normal, proceed to the next step.

3. Start PCM600 and select the relay under modification from the Plant Structure.
4. Start Update IED.

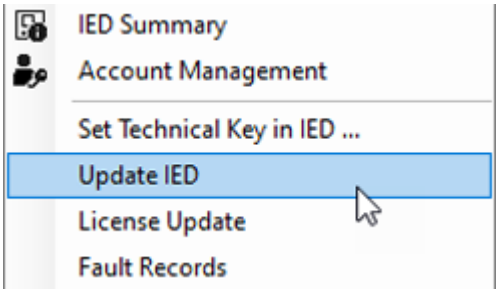

Figure 3: Starting Update IED

5. Browse for the .zip file from the local disk and open it. The delivered package has two different packages, one with the software and license and other with only the license. Package ModificationDataLicense is for updating only the license.

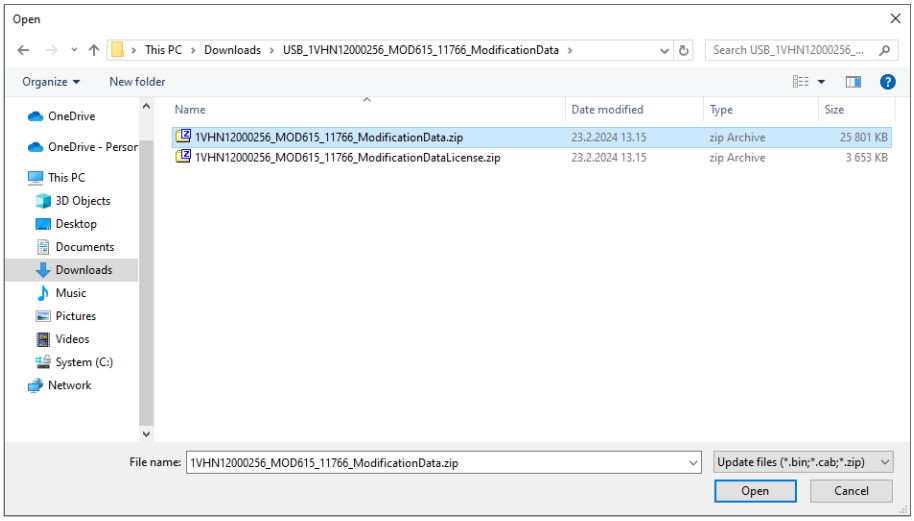

Figure 4: Opening the .zip file

6. Follow the instructions given by the update wizard.

   The process takes several minutes and afterwards the relay is in the default factory state.

7. After the relay license update is completed, start License Update if the license update has not been carried out offline (see Enabling new hardware or functions in relay configuration). This updates the PCM600 configuration to match the new relay license.

The check box **Start License Update automatically** is selected by default.

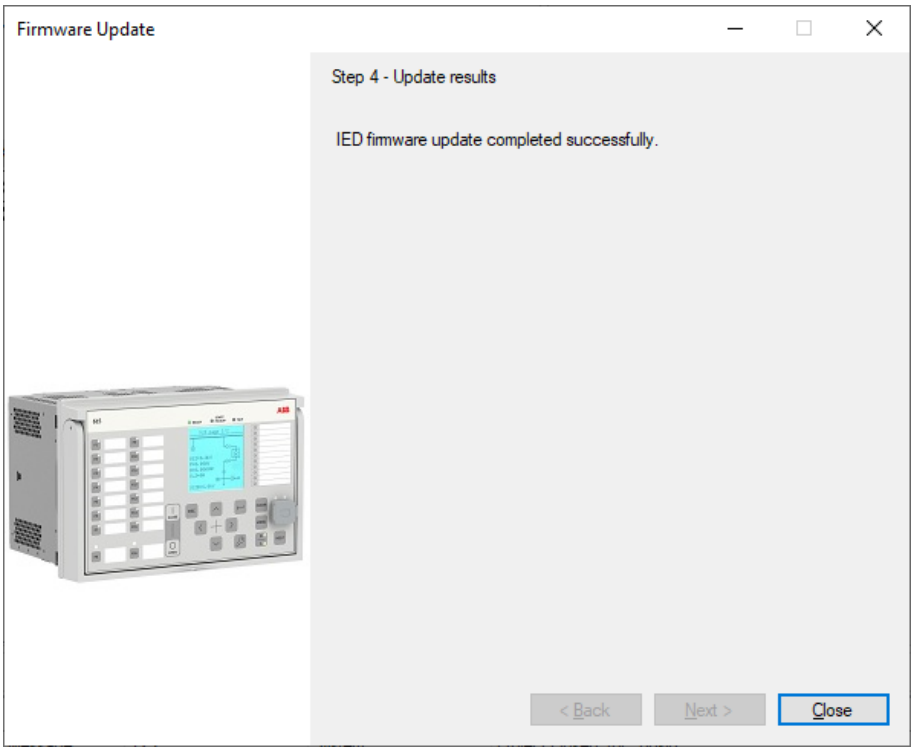

Figure 5: Starting license update

8. Follow the instructions given by the License Update wizard.

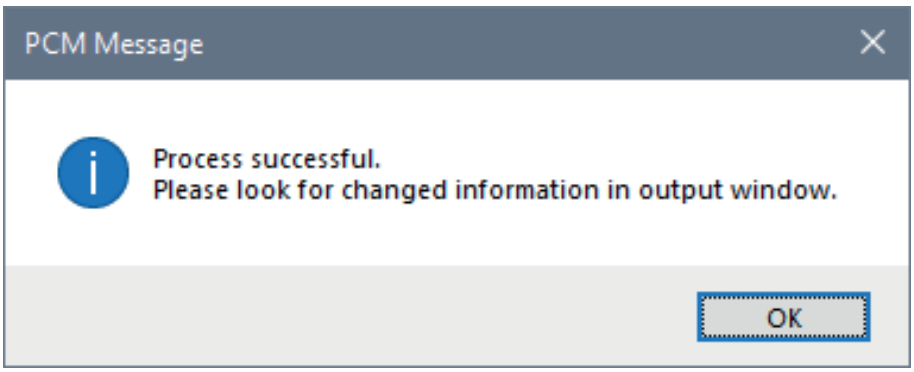

Figure 6: Successful license update

The relay configuration in PCM600 can now be modified with the required changes to enable the new functionality. Or, if already prepared offline, the configuration and settings can be written to the relay (**Write to IED**).

5.4 Enabling new hardware or functions in relay configuration

IED Update updates only the license and the relay for the modified hardware and software. In addition, the relay needs to be modified to enable the required new functions. The configuration modification contains two steps.

1. Update the PCM600 configuration online or offline to match the new relay license using License Update.
   - The configuration is updated online when PCM600 has a connection to the relay: License Update reads the updated license information from the relay, shows the relay composition information and updates the PCM600 configuration.

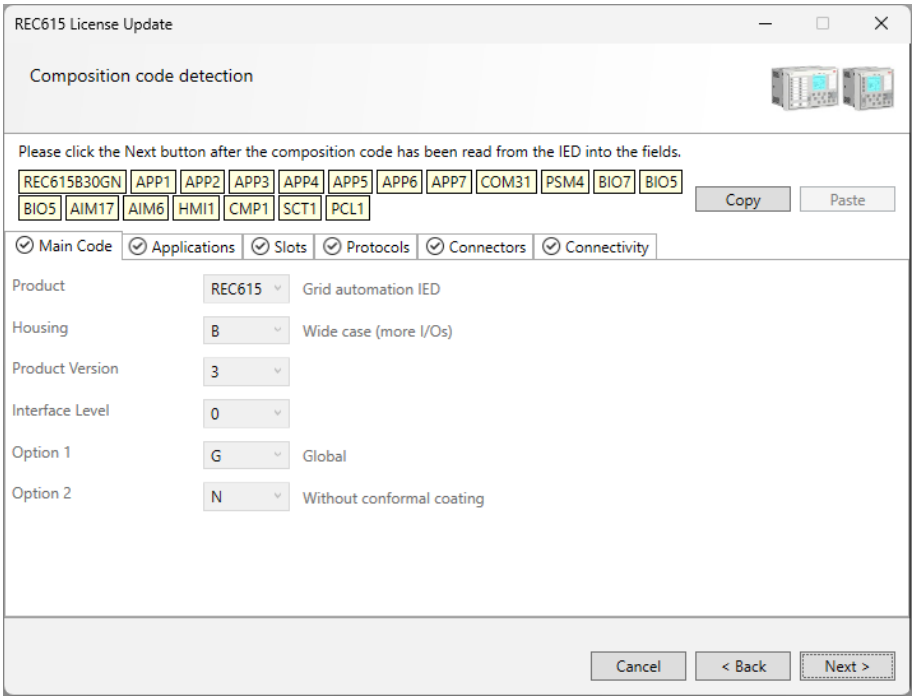

Figure 7: Using License Update online

   - The configuration is updated offline when PCM600 does not have a connection to the relay: the relay composition information is manually edited in License Update to correspond to the new functionality. The PCM600 configuration is then updated to match the new relay composition, that is, the license.

2. After the license update, modify the relay configuration to enable the required functions in the relay by using Application Configuration, Graphical Display Editor, Signal Matrix, IEC 61850 Configuration or other tool components in PCM600 depending on the function.

The relay configuration and settings in PCM600 can be modified offline without a connection to the relay even before the relay license update. The prerequisite is to have the new relay composition updated to PCM600 using License Update. The needed modifications of the relay configuration can

then be done and saved in a PCM600 project. If this is done before the relay license update, License Update does not have to be started automatically as it is enough to write the modified configuration and settings to the relay (Write to IED).

The new relay composition updated offline in License Update must be identical to the license updated in the relay. Otherwise the modified configuration cannot be written to the relay until the composition matches the license found in the relay.

ENGINEER access rights are needed to update configuration.

ADMINISTRATOR access rights are needed to manage user access rights.

6 Verification

Before the relay is returned to normal service, the installed modifications have to be tested and commissioned. The recommendation is that minimum the changed functionality of both the hardware and the software be tested. The testing procedure for the modified part must be the same as when commissioning a new relay.

If the relay's hardware is extended by additional modules, the functionality that the new modules offer the relay has to be tested. If the relay hardware setup is modified by changing an existing module type to a different one, additional checks regarding the removed functionality must be done.

7 Hardware modification example

Table 1: Example of the Relay module modification information table included in the relay modification delivery

Slot	Original relay (wide)		Action	Modified relay (wide)	
	Item	Description		Item	Description
X000	2RAA005844A0004	COM1	Unchanged	2RAA005844A0004	COM1
X100	2RCA025059A0001	PSM4	Unchanged	2RCA025059A0001	PSM4
X105	Empty		Added	2RCA025501A0001	BIO5
X110	2RCA025501A0001	BIO5	Unchanged	2RCA025501A0001	BIO5
X115	2RCA025501A0001	BIO5	Unchanged	2RCA025501A0001	BIO5
X120	2RAA007128A0002	AIM17	Unchanged	2RAA007128A0002	AIM17
X130	2RCA021397A0001	AIM6	Unchanged	2RCA021397A0001	AIM6

Explanations

- Original relay columns define the slot allocation of the different modules that are included in the relay to be modified.
- Action column defines the action to be done per each slot of the relay.
  - Unchanged: slot is not affected by the modification
  - Changed: slot content is changed by the modification, that is, to another module type
  - Added: a new module is added to an empty slot by the modification
- Modified relay columns define the slot allocation of the different modules after the modification is completed.

8 Glossary

CAT 6	Cable standard for gigabit Ethernet and other network protocols that is backward compatible with CAT 5/5e and CAT 3 cable standards
DHCP	Dynamic host configuration protocol
EMC	Electromagnetic compatibility
Ethernet	A standard for connecting a family of frame-based computer networking technologies into a LAN.
HMI	Human-machine interface
IEC	International electrotechnical commission
IED	Intelligent electronic device
IRF	1. Internal fault 2. Internal relay fault
LAN	Local area network
LHMI	Local human-machine interface
PCM600	Protection and control IED manager
PST	1. Parameter setting tool in PCM600 2. Product selection tool
RJ-45	Galvanic connector type
USB	Universal serial bus

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